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ABSTRACT

Decision Support Systems (DSSs) are computer-based decision aids to use when making decisions which are partially amenable to rational decision-making procedures but contain elements where intuitive judgment is an essential component. In such situations, DSSs are used to improve the quality of decision-making. The DSS approach is based on Simon's (1960) bounded rationality model of decision-making. Replacing that model with a more detailed model of decision-making would increase the usefulness of DSSs. Janis and Mann's (1978) conflict theory of decision-making sees most significant decisions to be somewhat stressful. The challenge of a threat or an opportunity starts a decision-making process in which four questions are asked, resulting in the possibility of five basic outcomes: (1) unconflicted adherence, in which the person determines that the best course of action is to do nothing; (2) unconflicted change, in which the most immediately available alternative is selected without further consideration; (3) defensive avoidance, in which the problem is ignored; (4) hypervigilance, in which panic sets in; and (5) vigilance, in which a full and effective search of the alternatives can be made. The model also contains a Decisional Balance Sheet with which to evaluate decisions. This model of decision-making should enable the decision support model to be extended in a way which suggests new approaches to using computers as decision aids, especially in the area of career guidance. (NB)

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DECISION SUPPORT SYSTEMS AND THE CONFLICT MODEL OF DECISION MAKING: A STIMULUS FOR NEW COMPUTER-ASSISTED CAREERS GUIDANCE SYSTEMS

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INTRODUCTION

It is a great honour for me to present this paper at the AACD Convention. I very much appreciate the opportunity it gives me to report some of the work we are doing at Birkbeck College in London, but it is important for me in another way. This is because it also represents the latest stage in our continuing collaboration with the Department of Human Services and Studies at Florida State University.

This collaboration is proving to be most fruitful. It is becoming clear that one of the major reasons for this is because, while we have a close identity of interests, we also have subtly different views of the world.

I am an occupational psychologist from a British university department of occupational psychology. While I am sure that you will understand the words I am using, this division of psychology is not a familiar one in the United States, and it is probably worth explaining briefly how occupational psychology relates to American practice.

Industrial psychology (as it was originally known in both our countries) started at much the same time in the early years of the century. In the United Kingdom, as in the United States, a great deal was learnt during the First World War, and by 1921, Charles Samuel Myers, the leading British psychologist of the time, had established the National Institute of Industrial Psychology. The NIIP at this time was concerned with applying the knowledge gained during the war on fatigue, and it rapidly extended its area of interest to include aspects of what today we would call work design.

Up until this time the interests of industrial psychologists in both countries were broadly similar. Indeed, the principal concerns of the

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NIIP in London can be seen to be almost identical to those which originally informed the work which gave American industrial psychology its next point of departure, at the Hawthorne plant of the Western Electric Company, here in Chicago.

In 1928, Myers took on a research assistant who was to give British industrial psychology its distinctive character, Alec Rodger. Throughout the 1930s, Rodger's main concern was for vocational guidance, which he developed rapidly through work in London schools, and his breadth of perspective was increased yet again during the Second World War, during which time he worked for the British Admiralty.

Through this combination of experience, he came to see the practice of this branch of psychology as integrating the interests of both the organisation and the individual, through the process of, as he put it himself, "fitting the man to the job and fitting the job to the man". Selection, training, careers guidance and work design were seen as part of an integrated whole, and Rodger thought that the label "industrial" by now was quite inappropriately narrow - hence the change to the title "occupational psychology".

Alec Rodger was rewarded for his pioneering work by being given a university department of his own, the first university department of applied psychology in the United Kingdom. This is the department in which I work and, where, incidentally, I was the last person to be appointed by Alec Rodger himself. Since his retirement in 1975, and his untimely death in 1982, the scope of the work has remained as it was, with some minor changes and one major change: we have been increasingly influenced, as is also true of I/O psychology in the US, by the overriding precept that the most appropriate frame of reference for our work is that of the organisation.

I hope I will be forgiven for this lengthy introduction, but I hope also that it explains how it can come to be that, as neither a counsellor nor counselling psychologist, it can have happened that I have interests in computer-assisted career guidance. It should also help give the necessary background to what follows.

DECISION SUPPORT SYSTEMS

I came to Alec Rodger's department in 1974, from the British Steel Corporation, where I had been working on the development of computer-based decision aids for steel production. The approach we had been using is one which later became known as that of "decision support systems" (DSSs) (Keen & Scott Morton, 1978). I have written elsewhere about the similarities and differences between DSSs and computer-assisted career guidance systems (CACGSS) (Ballantine, 1987; 1988, in press) so I will confine myself now to the most relevant points.

DSSs are applied in situations where the decisions are "semi-structured", in other words, where the decisions are partially amenable to rational

decision-making procedures but contain elements where intuitive judgement is an essential component. This may happen because vital information is unavailable, but it also can occur because it is simply impractical to obtain relevant information within the time allowed for a decision. In such situations, it is argued, the quality of decision-making can be improved considerably by various means of support, including computer aids.

Prominent in the design of DSSs are the assumptions that the computer system should support human decision making and not replace it, and that decision making is not an isolated, individual phenomenon but involves communication with others. The corollary of this latter point is that, if decision-making is improved, then it will associated with a changed pattern of communication. Decision-making is thus a social affair, and changing the way in which business decisions in particular are made is a matter of organisational change.

Applying this rationale to career decision-making, it can be seen at once that career decision-making in general is best viewed in the context of appropriate role-set of the decision-maker. In the particular case of within-organisation career development, the appropriate frame of reference is to be found largely within the organisation itself. In the case of a client seeking help from an agency such as a careers service which uses CACGSs, attention is directed away from the direct relationship between client and computer towards that of the relationship between client and the agency which uses the computers. This, incidentally, follows the analysis of Kling & Scacchi (1979, 1982) who observe that, in general, most computer users' problems can be better explained in terms of the relationship between user and computer-providing agency than in terms of that between user and the computer itself.

Looked at more thoroughly than is possible here, it is clear that this approach offers interesting possibilities for informing the development of future CACGSs. There is one major problem, however. The DSS approach is based explicitly upon Simon's bounded rationality model of decision-making (Simon, 1960), and while this may be adequate for supporting business decisions, it is too "coarse-grained" for our own purposes. Its strengths are clear, however: it admits to distinctions between rational and non-rational processes within the same model (the "optimising" and "satisficing" strategies for which it is probably best known) and it is congruent with an organisational perspective. Replacing the model with a similar, but more detailed model of decision-making would increase the usefulness of these ideas considerably. Such a model is to be found in Janis & Mann's conflict theory of decision-making.

JANIS & MANN'S CONFLICT MODEL OF DECISION-MAKING

Just over ten years ago, Irving Janis and Leon Mann published a theory which extends Simon's ideas to a considerable extent (Janis & Mann, 1978). One aspect of it which has made it well-known is that it explains well how top-level group policy decisions can be made so badly. The

analysis of the failure to defend Pearl Harbour and of President Kennedy´s disastrous decisions in the Bay of Pigs incident have earned the theory a considerable reputation. Perhaps because of this reputation, it seems to have been overlooked that the original theory applied as much to personal decisions as to group decisions. Indeed, the analysis of career decisions was prominent in the original book and, furthermore, the usefulness of the theory for counselling has been explored (Janis, 1982). In the United Kingdom, these developments have not made a great impact, however, and I understand that even in the United States the theory is not prominent in counselling practice.

The theory is complex, and only a simplified version of it will be given here. Two aspects will be considered: the basic decision-making process and the means for evaluating decisions - "the decisional balance sheet".

Janis & Mann´s view of the process of decision-making

The starting point for Janis & Mann´s view of decision-making is the realisation that most significant decisions are to some extent stressful. By looking at decisions which were clearly stressful, they devised a scheme which can be easily shown in the form of a flow-chart. The challenge of a threat or an opportunity starts a process in which, in effect, four questions are asked. This results in the possibility of five basic outcomes. These represent the ways in which people cope with the conflicts which arise in decision-making and are shown in figure 1. The importance of this scheme is that it is possible, by examining the types of information people seek, to identify where they are in this process. Also, research has enabled estimates to be made of the likelihood of regret after the decision has been made. Most important, the theory has been shown to be applicable to situations which are not especially stressful. The whole is characterised by what actually happens when decisions are made, "hot cognition", as the authors elegantly describe it.

"Unconflicted adherence" occurs if the person views the situation as one in which the best course of action is to do nothing and continue with whatever they are currently doing. "Unconflicted change" occurs if the most immediately available alternative is selected without further consideration. Both these outcomes produce extremely low stress, but can be risky because neither involve extensive consideration of the situation and the alternatives which are available. "Defensive avoidance" involves essentially ignoring the problem. It occurs in a number of forms and the scheme can be extended to show these in more detail. This is shown in Figure 2. The stress is highly variable, the person can remain unrealistically calm but sudden threats can produce high levels of uncontrolled stress. "Hypervigilance" is commonly known as panic. It occurs when it is clear that something needs to be done, that there are risks in both doing nothing and accepting the most obvious alternative, that there are realistic alternatives but that there is insufficient time to search for them. It is a state which is characterised by a very high level of stress, in which there is a considerable amount of unproductive and ineffective search. "Vigilance" is the name given to the state in which a full and effective search of the alternatives can be made. If the

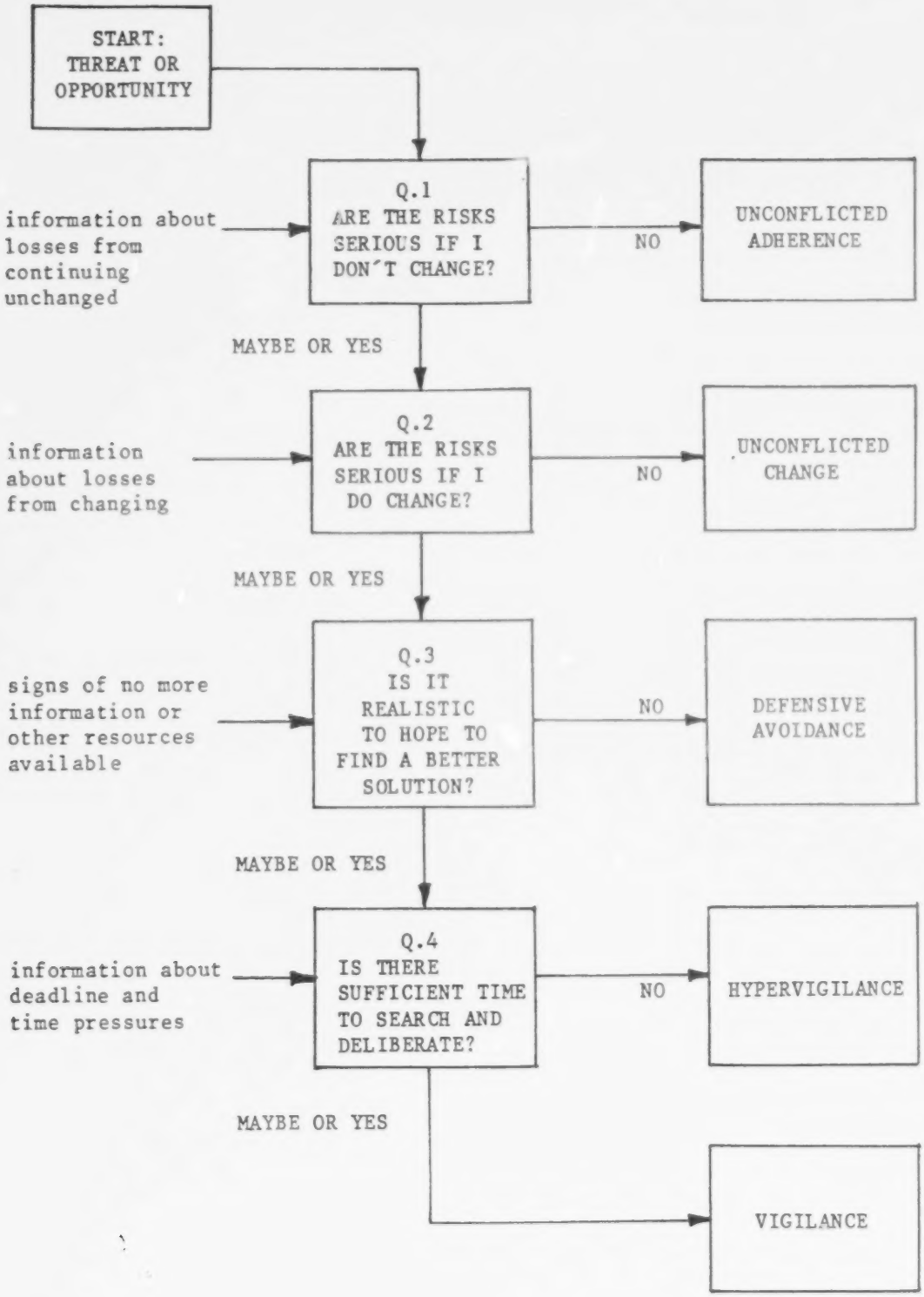

Figure 1: The basic decision-making process

situation allows it, this is the state in which rational, logical decisions can be made. Stress is moderate, but controlled and productive.

Further consideration needs to be given to defensive avoidance, which, as has already been noted, exists in a number of forms. (see Figure 2.)

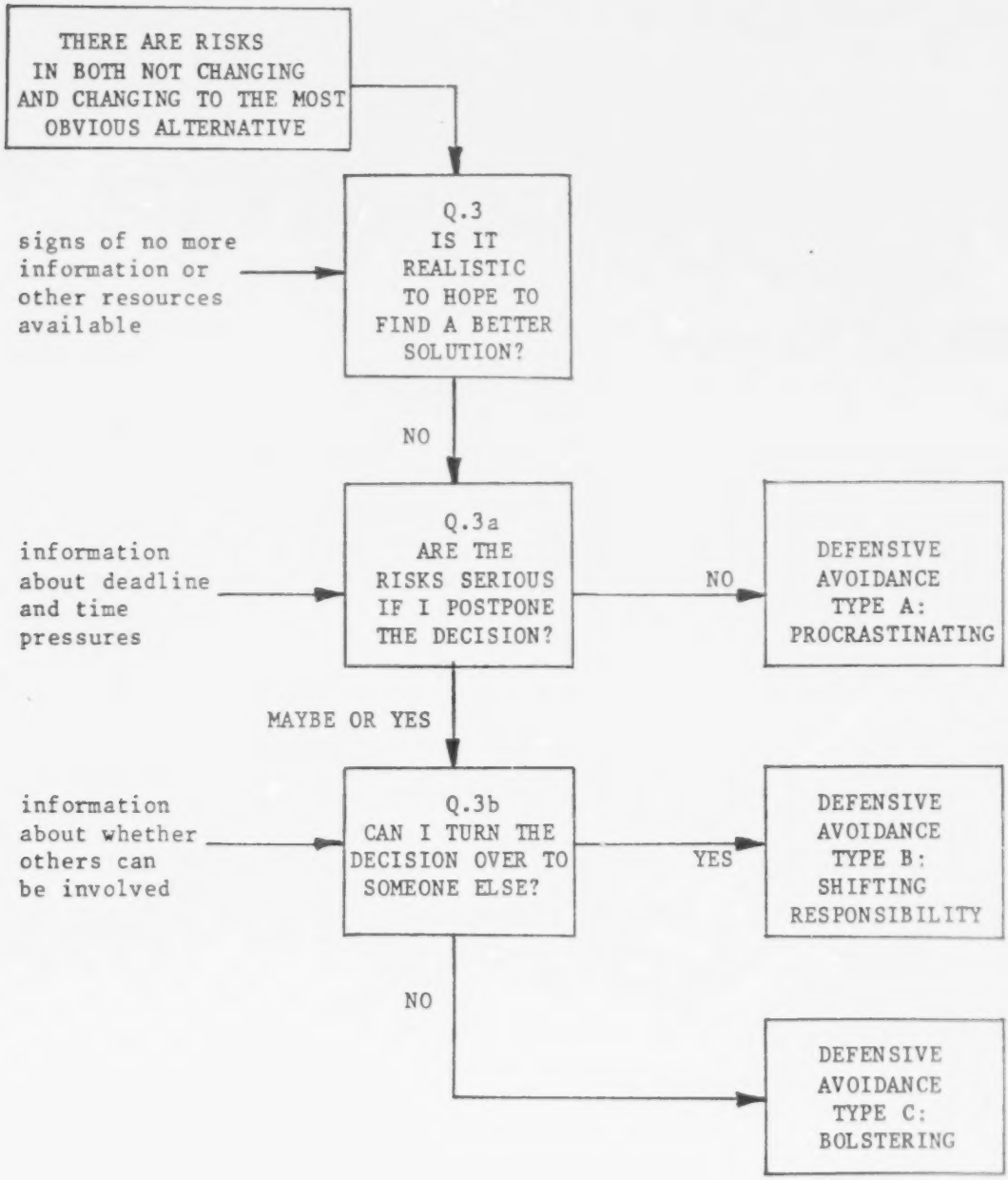
THERE ARE RISKS IN BOTH NOT CHANGING AND CHANGING TO THE MOST OBVIOUS ALTERNATIVE
signs of no more information or other resources available
Q.3 IS IT REALISTIC TO HOPE TO FIND A BETTER SOLUTION?
NO
information about deadline and time pressures
Q.3a ARE THE RISKS SERIOUS IF I POSTPONE THE DECISION?
NO
DEFENSIVE AVOIDANCE TYPE A: PROCRASTINATING
MAYBE OR YES
information about whether others can be involved
Q.3b CAN I TURN THE DECISION OVER TO SOMEONE ELSE?
YES
DEFENSIVE AVOIDANCE TYPE B: SHIFTING RESPONSIBILITY
NO
DEFENSIVE AVOIDANCE TYPE C: BOLSTERING

Figure 2: Varieties of Defensive Avoidance

If it is felt that, despite the fact that a decision needs to be made, there is no risk in postponing it, then the response will be defensive avoidance type A: procrastinating. If, on the other hand, there is a clear risk in postponing the decision, then the inclination will be to shift responsibility to someone else - a type B response. If this course of action is not open, then the final alternative is to simply select the least objectionable alternative which presents itself. This process potentially involves considerable personal conflict, so the most common response is to re-interpret the evidence. Either the advantages of the choice are unrealistically over-emphasised or the disadvantages are unrealistically played down. This process, which reduces the conflict and makes a poor choice acceptable, is known as "bolstering", a type C response. Incidentally, Festinger's (1957) principle of post-decisional resolution of cognitive dissonance can be subsumed under bolstering - and given a more satisfactory explanation.

Evaluating decisions - The Decisional Balance Sheet

In Janis & Mann's theory, evaluation of decisions is held to depend on two separate sources of influence: utilitarian (especially directly identifiable rewards, such as income) and approval (or the threat of disapproval). Each of these, in turn, can have its origins in the decision makers themselves, or in others. This leads to four separate categories of considerations, which must be balanced against one another in the decision: gains and losses for self; gains and losses for others; self approval or disapproval and approval or disapproval of others. Table 1, adapted from a report by Irving Janis, shows some of the factors which might affect career choice categorised in this way.

In the counselling methods which have been developed from the theory, a formal method has been devised from this scheme, which involves comparing the alternative courses of action by weighing up the pro's and con's of each alternative in the categories in Table 1.

USE OF THE THEORY

Before continuing with the process of adapting the decision support approach to include Janis & Mann's theory, it was decided to test the model against data obtained from people involved in career change. In the summer of 1987, with the co-operation of a recruitment consultancy involved in placing computer programmers and systems analysts, sixty people were interviewed close to the time at which they were making decisions on job change. This is a particularly interesting group to have studied, because, while there is a basic similarity in the work they all do, there is very great variation between individuals in their employability. This is largely determined by the particular experience they have (for example, with particular computer hardware and software).

The basic design was to ask people who were attending the company's offices for job interview if they would also be prepared to participate in one additional interview for research. Only two people refused. By this

means almost all were interviewed very close to the decision actually being made, in a number of cases within a few minutes of their final commitment.

Table 1: List of considerations that might affect career choice

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1. Utilitarian considerations: gains and losses for self

a. income
b. difficulty of the work
c. interest level of the work
d. freedom to select work tasks
e. chances of advancement
f. security
g. time available for personal interests
h. other

2. Utilitarian considerations: gains and losses for others

a. income for family
b. status for family
c. time available for family
d. kind of environment for family, eg stimulating, dull etc.
e. being able to help an organisation or group, eg social, political, religious
f. other, eg fringe benefits for family

3. Self-approval or disapproval

a. self-esteem
b. extent to which work tasks are ethically justifiable
c. extent to which work will involve compromising oneself
d. creativeness or originality of work
e. extent to which job will involve a way of life that meets one´s moral or ethical standards
f. opportunity to fulfill long-range life goals
g. other, eg extent to which work is "more than a job"

4. Approval or disapproval from others

a. parents
b. friends
c. husband or wife
d. colleagues
e. community at large
f. others

Source: JANIS, I L (1968) "Pilot Studies on New Procedures for Improving the Quality of Decision Making" New Haven, CT: Yale University

People in this sector of the labour market have a quite realistic expectation of being offered high incomes. In this situation, a very high proportion did not give a marked prominence to income in their decision-making. The most salient factor was fear of redundancy of skills, but "job satisfaction" was also high in importance. The particular sources of satisfaction in this group are being given interesting and demanding problems to work on, being given the autonomy to work on them with a minimum of supervision, and being able to see the job through to the end. Approval factors, both self-approval and approval of others, were manifest.

A significant proportion, certainly 25% and maybe as many as a third could have benefited from counselling for their decisions, and the major reasons for this were associated with an incomplete consideration of all relevant factors, leading to an "unconflicted change" response. Most prominent here were lack of awareness of the variety of factors leading to decision-making from too narrow a base, and, in particular, failing to take others into account sufficiently early in the decision process. Indeed, one recruitment consultant expressed the view that his major problem stemmed from clients making decisions to accept jobs only to discover that their spouse and family could not accept the resulting move of home and school.

CONCLUSIONS AND IMPLICATIONS FOR COUNSELLING PRACTICE

The conclusions that can be drawn from this work can only be tentative at this stage but are interesting nevertheless. While the terms in which I have been discussing the decision processes will hardly be unfamiliar to professional counsellors, the particular framework does seen to have some useful aspects to it.

Firstly, it summarises a complex set of processes in what appears to be a practically useful way. Secondly, it indicates the stages in decision-making where blocks are likely, and where stress is likely go occur. For example, defensive avoidance will be associated with a lack of openness to information which is challenging. Thirdly, it treats stress as both inhibiting and facilitating, it distinguishes between these and identifies the context in which each is likely to occur. This has particularly important effects on commitment, which is frequently even more important than the decision itself, and which often depends on the behaviour of others, especially those who the decision-maker respects. Fourthly, it provides a useful scheme for diagnosis and help. Lastly, and this is why it is particularly interesting in our present work, it should enable the decision support model to be extended in a way which suggests new approaches to using computers as decision aids.

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